Memorandum

To: Greg Allen
From: Jillian Adair, Michelle Peck
Date: October 27, 2016
Subject: Chesapeake Bay Toxics- Implementation of PCB TMDLs in NPDES Permits

Purpose

This document explores how total maximum daily loads (TMDL) for polychlorinated biphenyls (PCB) within the Chesapeake Bay Watershed are utilized in strategies to reduce PCB loadings from point sources. The successful implementation of PCB TMDLs is paramount to accomplishing the toxic contaminant goals established within the Chesapeake Bay Watershed Agreement.

Introduction

The Toxic Contaminant Workgroup (TCW) was established in 2014 to address the toxic contaminant goals outlined in the Chesapeake Bay Watershed Agreement, which was signed in 2014 by the Environmental Protection Agency (EPA), the Chesapeake Bay Commission, the District of Columbia, and the six watershed states of the Bay: Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia. Nearly 74 percent of the tidal water segments in the Chesapeake Bay are at least partially impaired by PCBs, a man-made toxic contaminant, which poses a major threat to human health and aquatic life. PCBs represent the most common toxic chemical contaminant in the Bay and an important goal of the Chesapeake Bay Agreement is to reduce their prevalence. PCBs are organic chlorine compounds that were produced in the United States from the 1930s through 1977. They were used in a variety of industrial processes for use as a coolant fluid and heat transfer fluid in electrical equipment, among other applications, often in closed systems. PCBs are hydrophobic and therefore able to linger in stream sediments and persist in the environment. Although their production was banned in 1977, PCBs are still inadvertently generated through industrial processes and spilled into the environment.

Current efforts to eliminate the prevalence of PCBs in the Chesapeake Bay Watershed include the development and implementation of TMDLs to establish waste load allocations (WLAs) for point sources and load allocations (LAs) for non-point sources. WLAs are established for permittees under the National Pollutant Discharge Elimination System (NPDES) program. Facilities that have the potential to discharge PCBs, including industrial waste process facilities, wastewater treatment plants (WWTP), and NPDES-regulated stormwater dischargers are prescribed a WLA in a PCB TMDL. NPDES permits are expected to address TMDL WLAs in order to achieve water quality standards and reduce toxic contamination in the Chesapeake Bay.

Methods

PCB TMDLs developed within the Chesapeake Bay Watershed were examined and NPDES regulated permittees that were found to discharge PCBs were identified (Table 1). The assurance of implementation section of the TMDL documents and relevant NPDES permits identified in the TMDLs were explored so as to identify current PCB reduction efforts within the watershed. Additionally, a small case study of the Delaware River Basin Commission (DRBC) was completed in an effort to evaluate the progress of other PCB load reduction programs.

Table 1: PCB TMDL Reports Completed within the Chesapeake Bay Watershed

TMDL Report	Approval Year	States	Watershed / Waterbody	NPDES Permittees (WWTPs)	NPDES Regulated Stormwater Permittees	NPDES Permittees (Other)
TMDL for the Susquehanna River, PCBs	1999	PA	Susquehanna River	0	0	0
Development of Senandoah River PCB TMDL	2001	VA, WV	Shenandoah River	1	0	1
TMDLs of PCBs for Tidal Portiosn of the Potomac and Anacostia Rivers	2007	DC, MD, VA	Potomac River Estuary	18	Aggregated	0
TMDLs of PCBs in the Bohemia River, Oligohaline Segment	2011	MD	Bohemia River Watershed	1	2	0
TMDL of PCBs in the Northeast and Northwest Branches of the Nontidal Anacostia River	2011	MD	NEB & NWB of the Anacostia River	2	6	0
TMDLs of PCBs in Northeast River, Tidal Fresh Segment	2011	MD	Northeast River Watershed	2	8	0
TMDLs of PCBs in the Sassafras River, Oligohaline Segment	2011	MD	Sassafras River Watershed	2	Aggregated (2)	0
TMDLs of PCBs in Corsica River of the Lower Chester River	2011	MD	Corsica River Watershed	1	0	0
TMDL of PCBs in Back River Oligohaline Tidal Chesapeake Bay Segment	2012	MD	Back River Tidal Estuary	1	4	0
TMDLs of PCBs in Baltimore Harbor, Curtis Creek/Bay, and Bear Creek Portions of Patapsco River	2012	MD	Patapsco River Estuary	2	5	6

TMDL Report	Approval Year	States	Watershed / Waterbody	NPDES Permittees (WWTPs)	NPDES Regulated Stormwater Permittees	NPDES Permittees (Other)
TMDLs of PCBs in the Elk River Oligohaline and the C&D Oligohaline Segments	2014	MD	Elk River Watershed	11	12	0
TMDL of PCBs in Lake Roland of Jones Falls Watershed	2014	MD	Lake Roland	1	22	0
TMDL of PCBs in the Magothy River Mesohaline Chesapeake Bay Tidal Segment	2015	MD	Magothy River	0	8	0
TMDL of PCBs in South River Mesohaline Chesapeake Bay Segment	2015	MD	South River	1	8	0
TMDL of PCBs in the Severn River, Mesohaline Chesapeake Bay Tidal Segment	2016	MD	Severn River	2	18	0
TMDL of PCBs in the Bush River Oligohaline Segment	2016	MD	Bush River Tidal Estuary	2	20	0
TMDL of PCBs in the West River and Rhode River, Mesohaline Segments	2016	MD	West River & Rhode River	1	4	0
TMDL of PCBs in the Gunpowder River and Bird River Oligohaline Segment	In Review	MD	The Gunpowder River and Bird River Watershed	0	41	0

[1]NPDES Permittees (Other) include industrial process water facilities and dredged material containment facilities

NPDES Regulations

PCB TMDLs incorporate numeric WLAs for NPDES permittees that discharges PCBs within the studied watershed. According to EPA NPDES regulations 40 CFR 122.44(k), permits are allowed to incorporate non-numeric water quality based effluent limitations (WQBEL) for certain pollutants such as PCBs. The regulation states that best management practices (BMP) may be used as WQBELs when "numeric effluent limitations are infeasible; or the practices [BMPs] are reasonably necessary to achieve effluent limitations and standards". Stormwater runoff is a major source of PCBs to the natural environment, through spill, leak and rupture of old transformers, capacitors and dielectric fluids. PCBs in PCB fluid stained soils are available for Stormwater to wash them via sewer and drain inlets to the waters of the Chesapeake Bay. These sources are not directly associated with industrial processes and wastewater discharges; therefore BMPs represent a viable method to decrease PCB loadings. BMPs are intended to facilitate PCB source tracking and elimination through PCB assessment and remediation.

Pollutant minimization plans (PMP) represent a strategy to incorporate successful BMPs into NPDES permits and are recommended as the primary pollutant reduction strategy within the Chesapeake Bay Watershed. As mandated by each permit, the PMP must identify known and potential PCB sources, provide strategies for identifying unknown sources, establish pollutant minimization measures (i.e. reducing runoff from urban areas, contaminated site remediation, reducing inputs to wastewater sewer systems, etc.), incorporate source prioritization, and determine progress monitoring and reporting requirements. Each year, the permittee must submit a PMP annual report to the State documenting monitoring data, current pollutant reduction measures, and achieved PCB reductions from baseline loads in an effort to determine the effectiveness of the PMP towards achieving maximum practicable PCB reductions. PMPs are developed individually by each permittee and approved by the permitting authority during the permit review process. EPA does not receive PMPs or the associated PMP annual reports from permittees or the States.

In all cases of PCB TMDLs within the Chesapeake Bay Watershed, no numeric effluent limitations are prescribed to facilities in NPDES permits. Instead, NPDES permits utilize monitoring approaches and pollutant minimization plans (PMPs) to address PCB loadings. Because PMPs or PMP annual reports are not made available to EPA, PMP effectiveness could not be explored in this report.

Case Study: The Delaware River Basin Commission

The Delaware River Basin Commission (DRBC) is the regional body given the authority of law to manage the water resources of the Delaware River as granted by the federal government and the four states of Delaware, New Jersey, Pennsylvania, and New York. In an effort to reduce PCB loadings into the Delaware Estuary, DRBC established a rule requiring dischargers to develop and implement PMPs for both point and non-point sources. The PMPs incorporate PCB monitoring using EPA's *1668 Revision A* approach and PCB source tracking and reduction. From 2005 to 2013, point source loadings were reduced by 64 percent overall and 71 percent by the top 10 dischargers, representing an effective PCB reduction program. During this period, over 90 percent of dischargers developed and initiated PMPs, which included enhanced treatment measures and successful source tracking and removal, leading to the observed reduction in PCB loadings. In 2006, DRBC published documents to aid WWTPs and industrial dischargers in developing PMPs for PCBs as a result of their PMP rule adopted in 2005. Furthermore in 2007, DRBC published a document to aid dischargers in formulating PMP annual reports.

DRBC regulation 4.30.9 states that any discharger receiving a WLA under a TMDL or an individual allocation by the Commission for PCBs must develop a PMP. The PMPs must aim to achieve the "maximum practicable reduction" of pollutant loadings as defined as the maximum reduction achievable after accounting for economic and technological feasibility. The PMPs are designed for 5 years and will be reviewed for renewal by the Commission prior to its expiration. If DRBC determines, at any time, that the PMP is ineffective at achieving the maximum practicable reduction, the Commission may require the discharger to submit a revised PMP. NPDES permits assigned to applicable dischargers

under 4.30.9 must apply the more stringent requirements set forth in the PMP or in other state and federal requirements with respect to PCB loadings.

Data Gaps

The information presented here to illustrate how PCB TMDLs are used to address point source loadings of PCBs within the Chesapeake Bay Watershed is limited by the lack of data availability. EPA does not have access to several permit documents, including PMPs and PMP annual reports, submitted by the permittees to the States. Additional research should seek to:

- Examine PMPs and PMP annual report submitted by permittees and approved by the States
- Determine the effectiveness of PMPs by quantifying PCB load reductions included in the annual PMP reports submitted by the permittees to the States
- Compare how permit and PMP regulations differ by State in the Chesapeake Bay Watershed region
- Compare PCB reductions achieved in PMPs with the PCB load reduction goals set in the applicable TMDL report

Conclusion

NPDES permittees within the Chesapeake Bay Watershed utilize PCB PMPs as non-numeric BMP-based WQBELs. PMPs document known and probable sources of PCBs and identify potential pollutant minimization measures. Each year, the permittee submits a PMP annual report to the State, which describes current pollutant minimization measures and achieved reductions from baseline loads. PMPs may be a valuable strategy to reduce PCBs within the Chesapeake Bay watershed if implemented correctly, as demonstrated by DRBC. To determine if NPDES permittees are achieving the reductions proposed in PCB TMDLs, PMP effectiveness must be explored. Next steps should include coordinating with the States to document submitted PMPs and identify PCB load reductions by NPDES permittees.